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10/536,962	04/06/2006	Yuuichi Inaba	067471-0074	6377

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EXAMINER	
ULLAH, ELIAS	

ART UNIT	PAPER NUMBER
2892	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/536,962	INABA ET AL.	
	Examiner	Art Unit	
	ELIAS ULLAH	2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,4-10,18-25 and 28* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,5-10 and 18-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/31/2005, 11/7/2006, 2/15/2007, 3/27/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 2, 5-10, and 18-25 and 28 in the reply filed on January 15, 2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 5-10, 18-19, 25 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamaguchi et al. (Yamaguchi, US 2007/0058055).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

4. With regard to claim 5, Yamaguchi shows a solid-state imaging device including: a filter unit 406 (Fig. 5) that selectively transmits incoming light , the filter unit comprising: two λ/4 multilayer films 406a, 406c; and an insulation layer 406b sandwiched between the two λ/4 multilayer films (406a, 406c, 406e, 406g) wherein each of the λ/4 multilayer films 406a, 406c includes a plurality of dielectric layers (406b, 406d,406f) an optical thickness of the insulation layer is different from λ/4 (since insulation and λ/4 are made of different material thus those layer will have different optical thickness) , and a plurality of light-receiving units (403G, 406B and 403R) provided in a semiconductor substrate 401 two- dimensionally, wherein a portion of the insulation layer corresponding to each of the plurality of light- receiving units has an inwardly inclined lateral surface (Fig. 5).

5. With regard to claims 6-7, Yamaguchi shows a filter unit that selectively transmits incoming light, the filter unit comprising: two λ/4 multilayer films (406a, 406c, 406e, 406g); and an insulation layer 406b sandwiched (Fig. 5) between the two λ/4 multilayer films (406a, 406c, 406e, 406g), wherein each of the λ/4 multilayer films (406a, 406c, 406e, 406g) includes a plurality of dielectric layers (406b, 406d,406f), an optical thickness of the insulation layer is different from λ/4 (see above claim 5 discussions, and a plurality of light-receiving units (403G, 406B and 403R) provided in a semiconductor substrate 401 two- dimensionally.

The recitation of "wherein the optical thickness of the insulation layer continuously changes, so that each of the plurality of light-receiving units receives a particular wavelength of light" is only a statement of the inherent properties of the filter

unit 406 in (Fig. 5) shows in Yamaguchi is substantially identical (e.g. the insulation layer is made of silicon dioxide) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

6. With regard to claims 10 and 28, Yamaguchi shows a first filter unit having a first bandpass wavelength, the first filter unit including a first upper λ/4 multilayer film 406g (Fig. 5), a first lower λ/4 multilayer film 406e and a first insulation film 406f sandwiched (Fig. 5) between the first upper λ/4 multilayer film 406g and the first lower λ/4 multilayer film 406e, a second filter unit having a second bandpass wavelength different from the first bandpass wavelength, the second filter unit including a second upper λ/4 multilayer film 406c, a second lower λ/4 multilayer film 406a and a second insulation film 406b sandwiched (see Fig. 5) between the second upper λ/4 multilayer film 406c and the second lower λ/4 multilayer film 406a, wherein the optical thickness of the first insulation layer is different from the optical thickness of the second insulation layer [0117], and the upper λ/4 multilayer film and the lower λ/4 multilayer film of a first filter unit and the second filter unit have substantially the same center wavelength [0117].

7. With regard to claims 8-9, Yamaguchi shows an absorbing member 406 is provided on a main surface of the λ/4 multilayer films 406a, c, e g) which faces away

form the insulating layer 406f the main surface partly reflecting the incoming light and the absorbing member is color filter 406 congaing pigments or dyes 407.

8. With regard to claim 18, Yamaguchi shows a plurality of light receiving units(403R, G, B) provided in a semiconductor substrate 2 two dimensionally wherein a wavelength of light received by each of the plurality of light-receiving units (403R, G, B) is determined based on whether the insulation layer has a portion in correspondence with the light- receiving unit, and, if the insulation layer has the portion, a thickness and/or a material of the portion of the insulation layer (see above claims 6-7 discussions).

9. With regard to claim 19, Yamaguchi shows upper λ/4 multilayer film 406g and the lower λ/4 multilayer 406a film are symmetrically structured (Fig. 5) with respect to the first insulation layer 406f or the second insulation layer 406b.

10. With regard to claim 25, Yamaguchi shows a solid-state imaging device including a plurality of unit pixels (403B, R, G) arranged two-dimensionally, each of the plurality of unit pixels comprising: a light-receiving unit 406 detecting an intensity of light; and a filter unit having a λ/4 multilayer film (406a, c, f, g) constituted by a plurality of dielectric layers 406f, d, b), the filter unit transmitting one of red light (403R), green light (403G), and blue light (403B), wherein the plurality of unit pixels are arranged in Bayer array (Fig. 5), in such a manner that every four adjacent unit pixels making a square (Fig. 5) has two unit pixels that include filter units transmitting blue light 403B.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 2, 5-10, 18-20, 23-25, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mellor (US 4,931,315) in view of Descure (US 6,960,799).

With regard to claim 5, Mellor teaches a solid-state imaging device including: a filter unit that selectively transmits incoming light, the filter unit comprising: two λ/4 multilayer films (21 and 27 in Fig. 5); and an insulation layer 24 sandwiched between the two λ/4 multilayer films (21 and 27), wherein each of the λ/4 multilayer films includes a plurality of dielectric layers (22 and 26), an optical thickness of the insulation layer is different from λ/4 (since insulation layer made of oxide and λ/4 made of TiO_2, thus optical thickness of both layers are not the same).

Mellor fails to teach a plurality of light receiving units provided in a semiconductor substrate two dimensionally, wherein a portion of the insulation layer corresponding to each of the plurality of light receiving units has an inwardly inclined lateral surface.

However, Descure teaches a plurality of light receiving units (Fig. 2C; 1R, 1G, 1B) provided in a semiconductor substrate 2 two dimensionally, wherein a portion of the insulation layer 4-1 corresponding to each of the plurality of light receiving units 1R, 1G, 1B has an inwardly inclined lateral surface (See Fig. 2C). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to use a plurality of light receiving units provided in a semiconductor substrate two dimensionally, wherein a portion of the insulation layer corresponding to each of the plurality of light receiving units has an inwardly inclined lateral surface teaching of Descure in the a solid state imaging device of Mellor, because a plurality of light receiving units with incline surface (see oxide been etched to form incline surface see col. 3 lines 4+) increase the storage capacity without increasing the dimension of an elementary cell of the sensor and without complicating its manufacturing process as taught by Descure in (col. 38+).

With regard to claims 6-7, Mellor shows a solid-state imaging device of including: a filter unit that selectively transmits incoming light, the filter unit comprising: two λ/4 multilayer films (21 and 27 in Fig. 5); and an insulation layer 24 sandwiched between the two λ/4 multilayer films (21 and 27 in Fig. 5), wherein each of the λ/4 multilayer films includes a plurality of dielectric layers (22 and 26).

Mellor fails to teach a plurality of light receiving units provided in a semiconductor substrate two-dimensionally and each of the light receiving units receives a particular wavelength of light (see above claim 5 discussions).

The recitation of "wherein the optical thickness of the insulation layer continuously changes" is only a statement of the inherent properties of the layers 21-27 in (Fig. 5) shows in Mellor is substantially identical (e.g. the insulation layer is made of silicon dioxide) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

With regard to claim 10, Mellor shows a camera including a solid state imaging device comprising: a first filter unit (layers 21-26 in Fig. 5) ; the first filter unit including a first upper λ/4 multilayer film 21, a first lower λ/4 multilayer film 27 and a first insulation film 26 sandwiched between the first upper λ/4 multilayer film 21 and the first lower λ/4 multilayer film 27, a second filter unit (layers 1-6), the second filter unit including a second upper λ /4 multilayer film 1, a second lower λ/4 multilayer film 5 and a second insulation film 4 sandwiched between the second upper λ/4 multilayer film 1 and the second lower λ/4 multilayer film 4.

The recitation of "the optical thickness of the first insulation layer is different from the optical thickness of the second insulation layer, and the upper λ/4 multilayer film and the lower λ/4 multilayer film of a first filter unit and the second filter unit have

substantially the same center wavelength" is only a statement of the inherent properties of the layers 21-27 in (Fig. 5) shows in Mellor is substantially identical (wherein first insulation layer 26 has a thickness 82.9nm and second insulation film 4 has thankless of 165.5 nm thus first and second insulation films will generate different optical thickness and the upper λ/4 multilayer film and the lower λ/4 multilayer film of a first filter unit and the second filter unit have substantially similar index thus those filter units also generate substantially same center wavelength) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

With regard to claim 28, Mellor shows a solid-state imaging device comprising: a first filter unit (bottom of stack in Fig. 5) including a first upper λ/4 multilayer film 21, a first lower λ/4 multilayer film 25 and a first insulation film 24 sandwiched between the first upper X/4 multilayer film 21 and the first lower λ/4 multilayer film 25, a second filter unit (top of stack in fig. 5) including a second upper λ/4 multilayer film 3, a second lower λ/4 multilayer film 5 and a second insulation film 4 sandwiched between the second upper λ/4 multilayer film 3 and the second lower λ/4 multilayer film 5 .

The recitation of "the first filter unit having a first bandpass wavelength and the second filter unit having a second bandpass wavelength different from the first bandpass wavelength; wherein the optical thickness of the first insulation layer is

different from the one of the second insulation layer and the upper λ/4 multilayer film and the lower λ/4 multilayer film of a first filter unit and the second filter unit have substantially the same center wavelength" is only a statement of the inherent properties of the bottom and top stack layers in Fig. 5 shows in Mellor is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

With regard to claim 2, Mellor shows upper λ/4 multilayer film includes: a first dielectric layer 23 made of a material having a different refractive index from a material forming the insulation layer 24 (wherein layer 24 is made low index and layer 23 made of high index); and a second dielectric layer 22 made of a material having a substantially same refractive inc as the material forming the insulation layer 24 (wherein both layer 24 and 22 made of silicon dioxide), wherein the first dielectric layer 23 is formed so as to be in contact with a main surface of the insulation layer 24, and the second dielectric layer 22 is formed so as to be in contact with a main surface of the first dielectric layer 23 which faces away from the insulation layer 24.

With regard to claims 8-9, Mellor shows an absorbing member 26-27 is provided on a main surface of one of the λ/4 multilayer films 25 which faces away from the insulation layer 24 the main surface partly reflecting the incoming light (col. 4, lines 48-

65) and the absorbing member 26-27 is a color filter congaing pigments or dyes (col. 4, lines 55-60).

With regard to claim 18, the reaction of "a plurality of light-receiving units provided in a semiconductor substrate two- dimensionally, wherein a wavelength of light received by each of the plurality of light-receiving units is determined based on whether the insulation layer has a portion in correspondence with the light- receiving unit, and, if the insulation layer has the portion, a thickness and/or a material of the portion of the insulation layer" see above claims 6-7 discussions.

With regard to claim 19, Mellor shows upper λ/4 multilayer film 21 and the lower λ/4 multilayer film25 are symmetrically structured (Fig. 5) with respect to the first insulation layer 24 or the second insulation layers.

With regard to claim 20, Mellor shows a dielectric layer 22 that is positioned most distant form the light receiving unit 26-27 being made of a low refraction index material (layer 22 made low index see fig. 5).

With regard to claim 23, Mellor shows a light collecting unit (halfwave hole see abstract) collecting the incoming light (see abstract), wherein a portion of the filter unit (bottom stack layer) corresponding to each of the plurality of light receiving units transmits a wavelength, and main surface of the filter unit (21) which faces away from the plurality of light receiving units is flat (Fig. 5).

With regard to claim 24, a distance between (i) the plurality of light-receiving unit (abstract) and (ii) a high refraction index layer 21 which is positioned closest to the

plurality of light-receiving units (abstract), among two or more high refraction index layers in the λ/4 multilayer film (21, 5), but Mellor falls to teach a range of 1 nm and λ.

However, Mellor teaches a general distance between light receiving unit and high refraction index layer (Fig. 5). Accordingly, it would have been obvious to one of ordinary skill in art to use teaching Mellor in the range as claimed, because it has been held that where the general conditions of the claims are discloses in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. MPEP 2144.05.

With regard to claim 25, Mellor shows each of the plurality of unit pixels comprising: a light-receiving unit detecting an intensity of light (abstract); and a filter unit having a λ/4 multilayer film (upper or bottom multilayer film) constituted by a plurality of dielectric layers 22 and 24.

The recitation "the filter unit transmitting one of red light, green light, and blue light, wherein the plurality of unit pixels are arranged in Bayer array, in such a manner that every four adjacent unit pixels making a square has two unit pixels that include filter units transmitting blue light" is only a statement of the inherent properties of the bottom and top stack layers in Fig. 5 shows in Mellor is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

14. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mellor (US 4,931,315) and Descure (US 6,960,799) as applied in claim 28 in further view of Sulzbach et al. (Sulzbach, US 3,996,461).

With regard to claims 21-22, Mellor and Descure fail to teach a protective layer being provided within the λ/4 multilayer film and the protective layer is made of silicon.

However, Sulzbach teaches a protective layer 10 (Fig. 2) being provided within the λ/4 multilayer film 12 and the protective layer is made of silicon (col. 2, lines 15-20). At the time the invention was made; it would have been obvious to a person having ordinary skill in the art to use a protective layer being provided within the λ/4 multilayer film and the protective layer is made of silicon teaching of Sulzbach in the a solid state imaging device of Mellor and Descure, because a protective layer make a contact between a multilayer and substrate as taught by Sulzbach in (col. 2, lines 15-25).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIAS ULLAH whose telephone number is (571)272-1415. The examiner can normally be reached on weekdays, between 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elias Ullah/
Examiner, Art Unit 2892

/Thao X Le/
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